IN THE DRAWINGS:

The attached drawing(s) include changes to FIGs. 1, 3, 4, and 7. The sheet containing FIG. 1 replaces the original sheet including FIG. 1. The sheet containing FIG. 3 replaces the original sheet including FIG. 3. The sheet containing FIG. 4 replaces the original sheet including FIG. 4. The sheet containing FIG. 7 and FIG. 8 replaces the original sheet including FIG. 7. and FIG. 8.

In FIGs. 1, 3, and 4 the term "COMMMMMPENSATOR" is replaced with the term --COMPENSATOR--. In FIG. 4, the labeling for amplifier "48" is replaced with --52--.

For the convenience of the Examiner, both annotated and replacement sheets are provided.

REMARKS

In accordance with the foregoing, the drawings, claims 1, 4, 5-7, 13, 17, 21, 25, and 27 are amended and new claims 28-33 are presented. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-33 are pending and under consideration. Reconsideration is respectfully requested.

Amendments To Drawings

FIGs. 1, 3, and 4 are amended to correct the spelling of the term --COMPENSATOR--. FIG. 7 is amended to correct an informality and label correctly label amplifier "48" as amplifier --52--. Support for the amendment is found on page 26, lines 10-11 that refers to FIG. 7 o "optical amplifier 52. No new matter is being presented, and approval and entry are respectfully requested.

Claim Amendments

Claim 1 is amended to a method of processing an optical signal includes" inputting signal light, and maintaining a width of a spectrum of the signal light inputted in the compensating; . . . wherein a spectrum of the second spectrally broadened light is wider than the spectrum of the first spectrally broadened light." Support for the amendment is found, for example , on page 10, lines 16-18. Claims 13, 25, and 27 are similar amended. Dependent claims 4, 6, 7 are amended to correspond to respective parent claim.

Claims 5 and 17 are amended herein to replace the term "and/or" with --and--. Claims 9 and 21 are amended to correct informalities.

No new matter is being presented, and approval and entry are respectfully requested.

Item 1: Objection To Drawings

In item 1 of the Office Action, the Examiner objects to the drawings because of the misspelling of the word "compensator" in FIGs. 1, 3, and 4. (Action at page 2).

In FIGs. 1, 3, and 4, the term "COMMMMMPENSATOR" is replaced with the term --COMPENSATOR--. Reconsideration and withdrawal of the objection to the drawings are respectfully requested.

Item 2: 35 U.S.C. §112, second paragraph rejection

In item 2 of the Office Action, the Examiner rejects claims 5, 6/5, 17, and 18/17 under 35 U.S.C. §112, second paragraph as being indefinite. The Examiner asserts that the phrase "and/or the second nonlinear optical medium" is unclear and that claims were examined using

limitation "or." (Action at page 3).

Claims 5 and 17 are amended herein to replace the term "and/or" with --and--. Reconsideration and withdrawal of the 35 U.S.C. §112, second paragraph rejection are respectfully requested.

Item 5: Rejection of claims 1-5, 7-11, 13-17, and 19-23 under 35 U.S.C. §102(b) as being anticipated by Sakamoto et al., All optical wavelengths conversion of 500-fs pulse trains by using a nonlinear optical loop mirror composed of a highly nonlinear DSF, May 2001, IEEE Photonics Technology letters, Vol. 13, No. 5

Item 7: Rejection of claims 6 and 18 under 35 U.S.C. §103(a) as being unpatentable over Sakamoto in view of Tatham et al. ("Transmission of 10Gbits directly modulated DFB signals over 200km standard fibre using mid-span spectral inversion")

Item 8: Rejection of claims 12 and 24 under 35 U.S.C. §103(a) as being unpatentable over Sakamoto in view of Mamyshev (US 6,141,129).

In item 5 of the Office Action, the Examiner rejects independent claims 1 and 13 (and respective dependent claims 2-5, 7-11, 14-17, and 19-23) under 35 U.S.C. §102(b) as being anticipated by Sakamoto. (Action at pages 3-9). In items 7-8 of the Office Action , the Examiner rejects dependent claims 6, 12, 18, and 24 as being unpatentable over Sakamoto in view of combinations of Tatham and Mamyshev.

The rejections are traversed.

As set forth in MPEP §706.02 entitled Rejection on Prior Art, anticipation requires the reference must teach every aspect of a claimed invention.

Sakamoto does not support an anticipatory-type rejection by not describing features recited in the present application's independent claims.

Independent claim 1 recites a method of processing an optical signal, comprising inputting signal light into a first nonlinear optical medium to broaden-a spectrum of the signal light through self phase modulation occurring in the first nonlinear optical medium, thereby obtaining first spectrally broadened light; compensating for chromatic dispersion effected on the first spectrally broadened light obtained in the inputting signal light, and maintaining a width of the spectrum of the signal light inputted in the compensating; and inputting the first spectrally broadened light processed by the compensating into a second nonlinear optical medium to broaden a spectrum of the first spectrally broadened light through self phase modulation occurring in the second nonlinear optical medium, thereby obtaining second spectrally broadened light; wherein a spectrum of the second spectrally broadened light is wider than the spectrum of the first spectrally broadened light." (emphasis added). Independent claim 13 has a similar recitation.

Applicants submit that Sakamoto does not teach such a "compensating for chromatic dispersion effected on the first spectrally broadened light obtained in the inputting signal light, and maintaining a width of the spectrum of the signal light inputted in the compensating." That is, according to an aspect of the present invention, the spectral broadening rate can be effectively increased.

By contrast, Sakamoto merely teaches that:

> By using a standard single-mode fiber with anomalous GVD, the SC pulses are compress to 0.48 ps, which is estimated from the intensity autocorrelation trace assuming the such waveform.

(See, page 504, col. 1, lines 11-13).

That is, Sakamoto does not teach maintaining widths of spectrums of the SC pulses in a standard single-mode fiber with anomalous GVD.

In addition, Applicants submit that Sakamoto does not teach that "a spectrum of the second spectrally broadened light is wider than the spectrum of the first spectrally broadened light."

By contrast, Sakamoto merely teaches that:

> [A} high nonlinear dispersion-shifted, fiber (HNL-DSF), which has a high Ge concentration in a small core, has been developed in order to enhance the optical nonlinearity.

(See, page 502, 1st col., lines 19-21.

Applicants submit that even if *arguendo* the HNL-DSF broadens a spectrum of the SC pulses which are compressed by the standard single-mode fiber with anomalous GVD, a spectrum of the SC pulse broadened by the HNL-DSF may not be broadened wider than a spectrum of SC pulse broadened by DPF, because a spectrum of SC pulse broadened by DFF may be compressed by the standard single-mode fiber with anomalous GVD.

In addition, as set forth in MPEP §2143.03 "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art."

The Examiner relies on Tatum merely to teach a compensating for chromatic dispersion occurring in an optical amplifier and relies on Mamyshev to teach an all-optical signal regenerator incorporating a plurality of bandpass filters (passbands), each having a unique center frequencies.

Applicants submit that neither Sakamoto in an *arguendo* combination with either Tatum or Mamyshev teach a method maintaining a width of the spectrum of the signal light inputted in the compensating and wherein a spectrum of the second spectrally broadened light is wider than

the spectrum of the first spectrally broadened light."

Summary

Since features recited by independent claims 1 and 13 (and respective dependent claims 2-5, 7-11, 14-17, and 19-23) are not taught by the cited art, alone or in combination, the rejection should be withdrawn and claims 1-5, 7-11, 13-17 and 19-23 allowed.

Item 9: Claims 25-27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Watanabe et al. (EP 1056173 A2) in view of Sakamoto

In item 9 of the Office Action, the Examiner rejects claims 25-27 under 35 U.S.C. §103(a) as being unpatentable over Watanabe in view of Sakamoto. The Examiner asserts that:

> Watanabe does not teach a specific configuration of an optical signal processing device as recited in Claim 25. However, Sakamoto teaches an optical signal processing device . .. . (and it is obvious to modify Watanabe) to use the wavelength converter specifically configured as taught by Sakamoto.

(Action at pages 14-15).

The rejection is traversed.

As set forth in MPEP §2143.03 "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art."

Applicants submit that features recited by claims 25-27 are not taught by the cited art alone or in combination.

Independent claim 25, as amended herein, recites a system including "an optical coupler for splitting signal light into first and second signal lights; . . . the optical signal processing device comprising: . . . a dispersion compensator for compensating for chromatic dispersion effected on the first spectrally broadened light obtained by the first nonlinear optical medium, and maintaining a width of the spectrum of the signal light inputted in the dispersion compensator; a second nonlinear optical medium for inputting the first spectrally broadened light processed by the dispersion compensator to broaden a spectrum of the first spectrally broadened light through self phase modulation occurring in the second nonlinear optical medium, thereby obtaining second spectrally broadened light; and an optical bandpass filter for inputting the second spectrally broadened light, having a passband whose center wavelength is different from a center wavelength of the second spectrally broadened light, thereby obtaining a signal component of the inputted light; wherein a spectrum of the second spectrally broadened light is wider than the spectrum of the first spectrally broadened light. " Claim 27, as amended herein, has a similar recitation.

As discussed in the traversal of the §102 rejection, Applicants submit that Sakamoto does not teach a device including "compensating for chromatic dispersion effected on the first spectrally broadened light obtained in the inputting signal light, and maintaining a width of the spectrum of the signal light inputted in the compensating." T

Further, as discussed in the traversal of the §102 rejection, Sakamoto does not teach "a spectrum of the second spectrally broadened light is wider than the spectrum of the first spectrally broadened light."

Accordingly, even an *arguendo* combination of Watanabe in view of Sakamoto does not teach features recited by claims 25-27.

Summary

Since features recited by independent claims 25 and 27 (and dependent claims 26 are not taught by the cited art, alone or in combination), the rejection should be withdrawn and claims 25-27 allowed.

New Claims 28-33

New claims 28-33 are presented to recite features in an alternative fashion.

New dependent claim 28 recites a method "wherein a pulse width of the second spectrally broadened light in a time axes is the same as a pulse width of the first spectrally broadened light in a time axes." New claim 29 has a similar recitation.

New claim 30 recites a method "inputting only the first spectrally broadened light processed by the compensating into a second nonlinear optical medium to broaden a spectrum of the first spectrally broadened light through self phase modulation occurring in the second nonlinear optical medium, thereby obtaining second spectrally broadened light." New claims 31-33 have a similar recitation.

Support for claims 28-29 is found for example in Figs. 1-4. Support for claims 30-33 is found, for example, on page 10, lines 16-18.

These, and other, features of claims 28-33 patentably distinguish from the cited art, and they are submitted to be allowable for the recitations therein. In particular, Applicants point out that Sakamoto merely teaches a HNL-DSF provided in NOLM and that:

> The HNL- DSF is effective for shortening the loop length and reducing the pulse width.

(See, page 503, lines 40 and 41).

However, Sakamoto does not teach that the HNL-DSF broadens the SC pulse compressed by SMF. Further, not only a SC pulse compressed by SMF but also CW light is

inputted to the HNL-DSF. Accordingly, not only a spectrum of the SC pulse but also a spectrum of CW light may be broadened by the HNL-DSF. The HNL-DSF does not broaden only the SC pulse compressed by SMF. That is, the HNL-DSF is not for broadening an only spectrum of the pulse compressed by SMF.

CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: December 18, 2006

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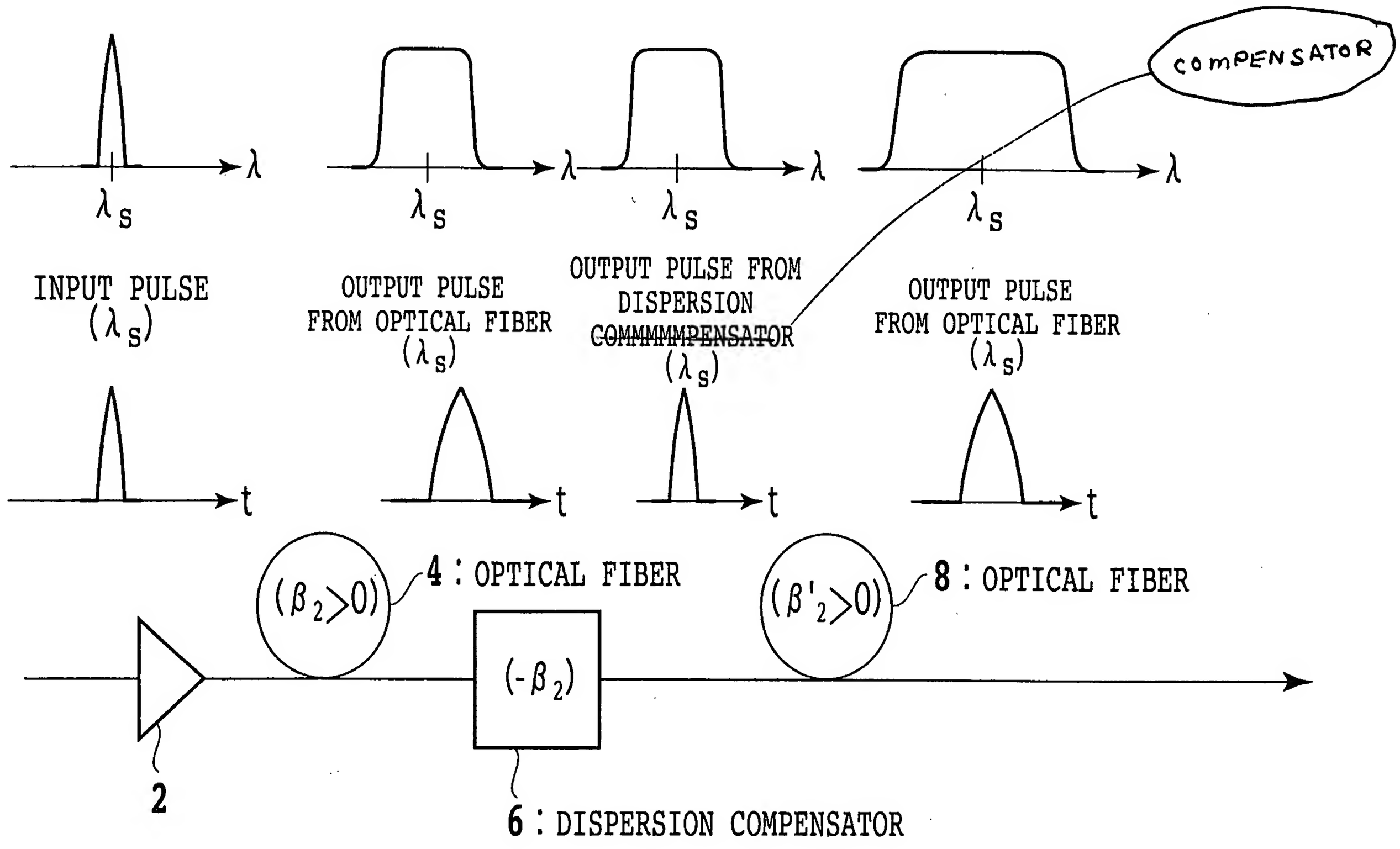
FIG. 1



ANNOTATED SHEET

FIG. 3

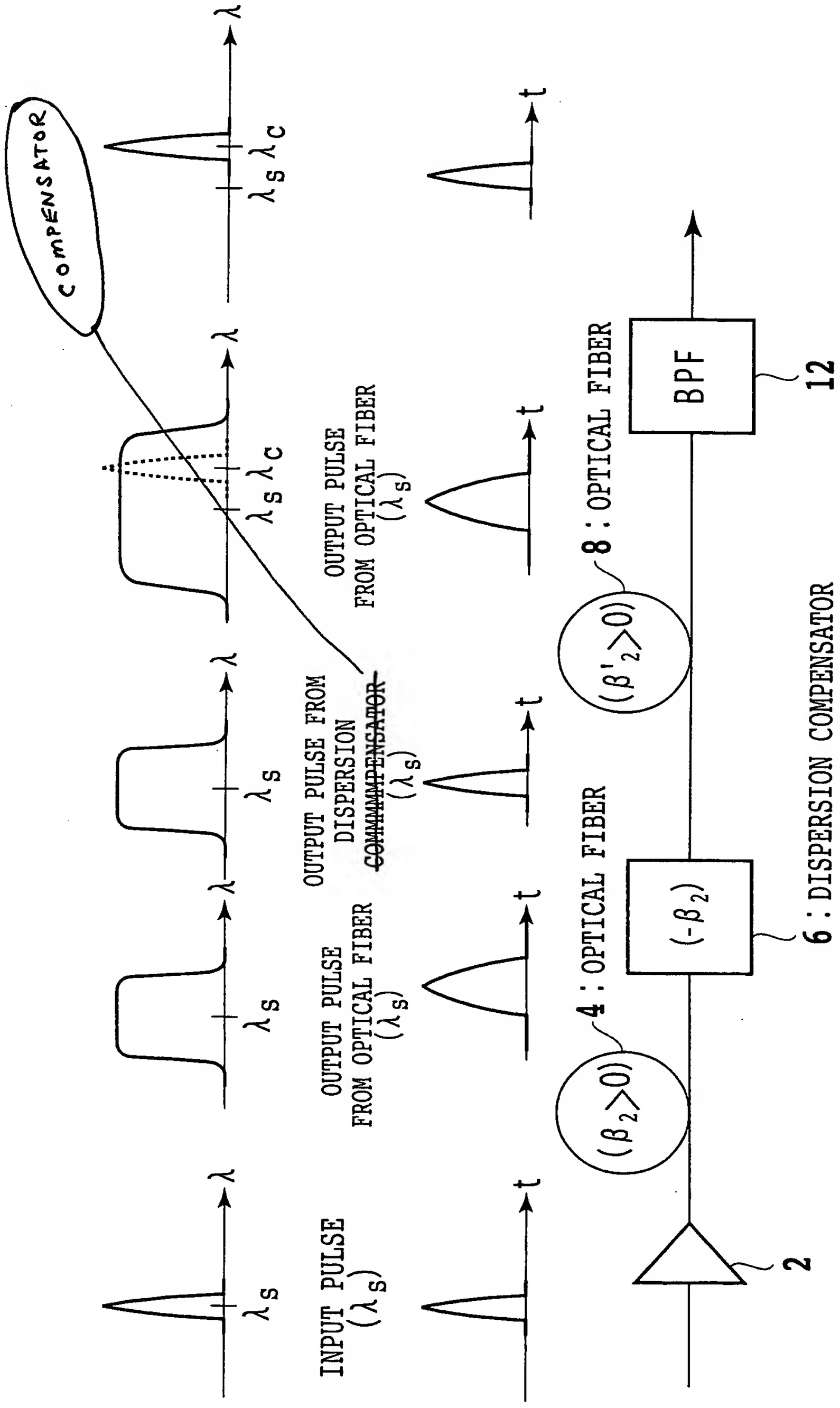
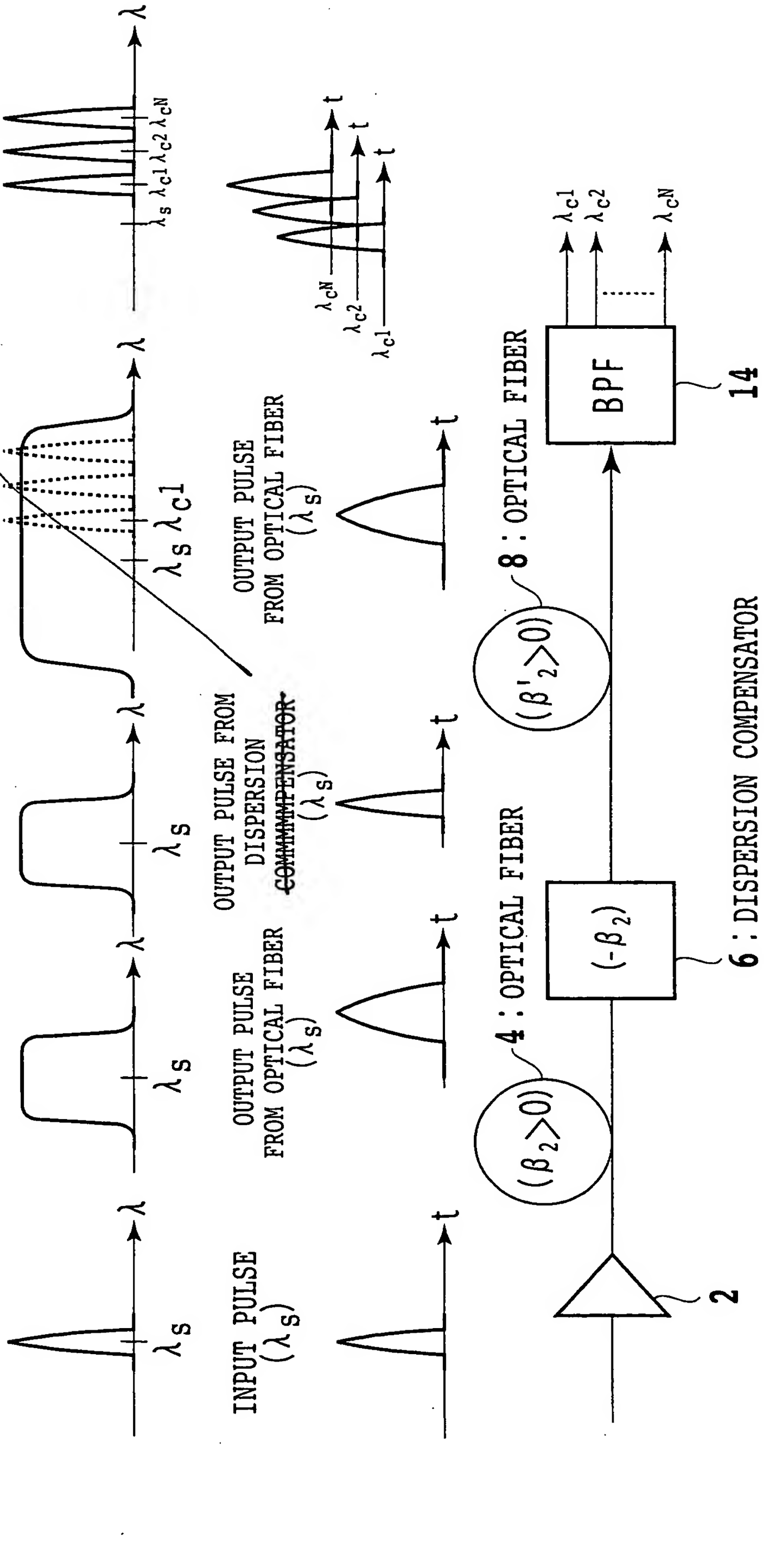

λ
λs λc
COMPENSATOR
t
λ
λs
λ
λs λc
OUTPUT PULSE FROM DISPERSION COMPENSATOR (λs)
OUTPUT PULSE FROM OPTICAL FIBER (λs)
t
t
8 : OPTICAL FIBER
(β'2>0)
BPF
12
λ
λs
INPUT PULSE (λs)
OUTPUT PULSE FROM OPTICAL FIBER (λs)
t
t
4 : OPTICAL FIBER
(β2<0)
(-β2)
6 : DISPERSION COMPENSATOR
2

FIG. 4


COMPENSATOR
λ
λ_s λ_{c1} λ_{c2} λ_{cN}
t
λ_{cN}
λ_{c2}
λ_{c1}
λ_{c1}
λ_{c2}
λ_{cN}
8 : OPTICAL FIBER
$(\beta'_2>0)$
BPF
14
λ_s λ_{c1}
OUTPUT PULSE
FROM OPTICAL FIBER
(λ_s)
OUTPUT PULSE FROM
DISPERSION
~~COMPENSATOR~~
(λ_s)
λ_s
4 : OPTICAL FIBER
$(\beta_2>0)$
$(-\beta_2)$
6 : DISPERSION COMPENSATOR
2
INPUT PULSE
(λ_s)

ANNOTATED SHEET

FIG. 7

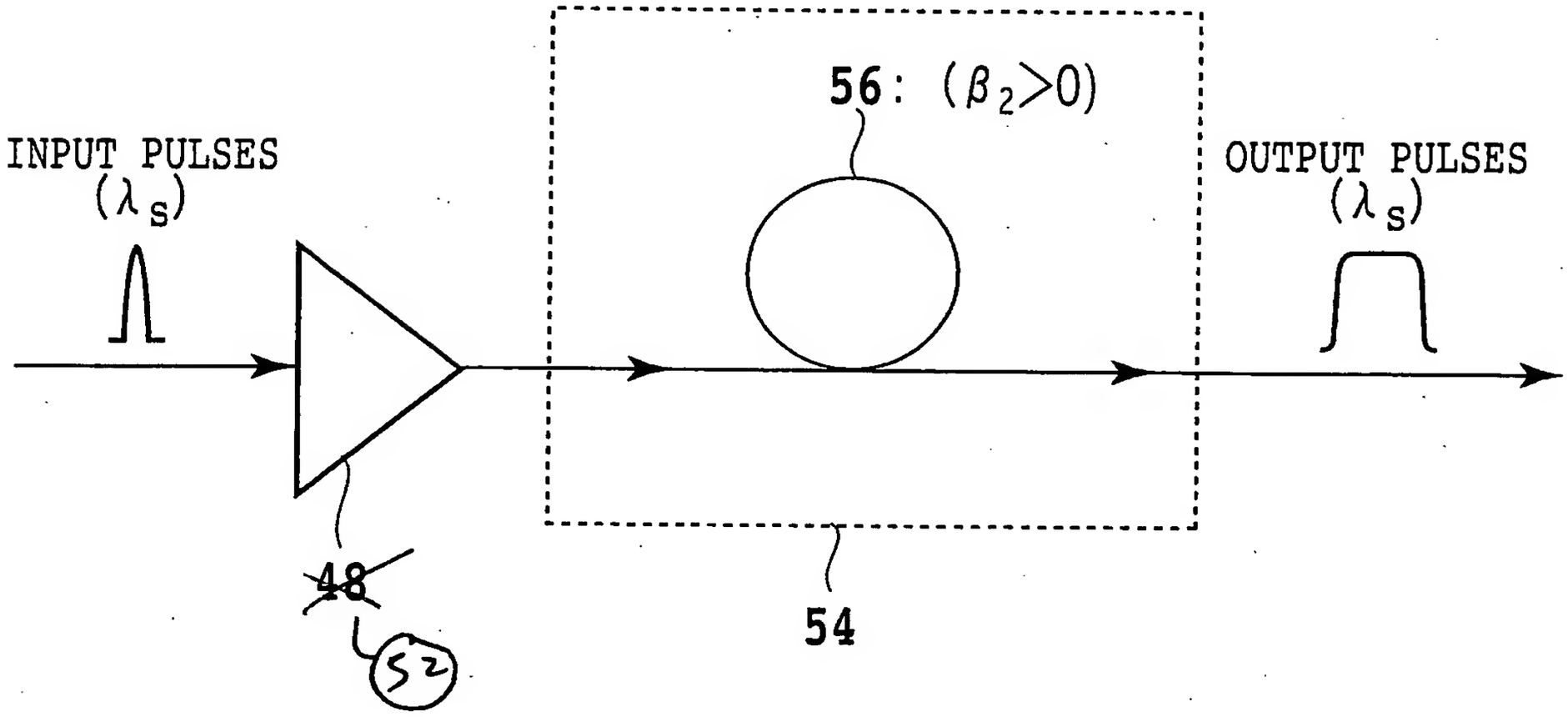


FIG. 8